either exclusively in the length or in the tension of the vocal chords, or in the size of the aperture of the glottis, or in the velocity or the temperature imparted to the air in its transit through these passages. He regards the organs of the voice as combining the properties of wind and of stringed musical instruments; and shows, first, that for the production of any musical tone it is necessary that the vocal chords should previously be made mutually to approximate; and, secondly, that the muscular forces acting on the arytenoid cartilages and vocal chords are adequate not only to resist the pressure of the column of air issuing from the lungs, but also to render either the whole or certain portions of the vocal chords susceptible of vibration when traversed by the current of respired air. In proportion as these parts of the vocal chords, thus rendered vibratory, increase in length, the number of their vibrations, performed in a given time, diminishes, and the tone of the sound emitted becomes, in consequence, more grave; and, conversely, the tone is more acute as the vibrating portions of the chord are shorter: these phænomena being precisely analogous to those which take place in stringed musical instruments.

The author concludes his paper with some observations on the comparative physiology of the voice; and on the extensive range and superior excellence of this faculty in man.

The following letter was read;

British Museum, February 26th, 1835.

My Dear Sir,

I am commanded by His Royal Highness the President of the Royal Society to request that you will state from the Chair, at the close of this evening's meeting, how sincerely His Royal Highness regrets that, in consequence of the opinion of Dr. Maton and his other medical advisers, he is obliged, *for the present*, to forego the pleasure, so truly gratifying to himself, of holding the usual Soirées at Kensington Palace. His Royal Highness, however, hopes that, by the blessing of Providence, he may yet have the satisfaction of receiving the Fellows as heretofore, before the termination of the present Session.

I am ever, my dear Sir, faithfully yours,
John George Children, Sec. R. S.

John William Lubbock, Esq.
V. P. and Treas. R. S.

March 5, 1835.

Sir BENJAMIN COLLINS BRODIE, Bart., Vice-President, in the Chair.

A paper was read, entitled, "A new Method of discovering the Equations of Caustics." By G. H. S. Johnson, M.A., Tutor of Queen's College, Oxford. Communicated by the Rev. Baden Powell, M.A., F.R.S.

Peculiar difficulty has hitherto attended the determination of the equation of the curve formed by the perpetual intersection of rays, which, diverging from a luminous point, are reflected by a polished surface of a given curvature. Curves of this description have been denominated caustics; and the method usually employed to discover their polar equations, or the relation between the radius vector of any point of the curve and the tangent at that point, is both long and inelegant, and is considered by the author as involving considerable inaccuracy of reasoning. He proposes, therefore, to substitute a new method of investigation, by taking the polar equation of one of the reflected rays, and differentiating this equation with respect to the arbitrary quantities solely which determine its position, and thus obtaining the polar co-ordinates of the point of intersection of two consecutive lines; and finally, by elimination, the equation of the curve in which all such points are found. He is thus led to results remarkable for their simplicity, elegance, and generality: and he gives particular applications of his method, exemplifying the facility with which it effects the solution of problems extremely difficult of management by the ordinary methods hitherto employed. His method is also applicable to the determination of the equations of the evolutes of curves, and to various other problems of a similar nature.

A paper was also read, entitled, "Discovery of the Metamorphoses in the second Type of the Cirripedes, viz. the *Lepades*, completing the Natural History of these singular Animals, and confirming their affinity with the Crustacea." By J. V. Thompson, Esq., F.L.S., Deputy Inspector General of Hospitals. Communicated by Sir James Macgrigor, Bart., M.D., F.R.S.

The discoveries made by the author of the remarkable metamorphoses which the animals composing the first family of the Cirripedes, or *Balani*, undergo in the progress of their developement, and which he has published in the third number of his Zoological Researches (p. 76), are in the present paper, which is intended as a prize Essay for one of the Royal Medals, followed up by the report of his discovery of similar changes exhibited by three species of two other genera of the second tribe of this family, namely, the *Lepades*. The larvæ of this tribe, like those of the Balani, have the external appearance of bivalve Monoculi, furnished with locomotive organs, in the form of three pairs of members, the most anterior of which are simple and the other bifid. The back of the animal is covered by an ample shield, terminating anteriorly in two extended horns, and posteriorly in a single elongated spinous process. Thus they possess considerable powers of locomotion, which, with the assistance of an organ of vision, enable them to seek their future permanent place of residence. The author is led from his researches to the conclusion that the Cirripedes do not constitute, as modern naturalists have considered them, a distinct class of animals, but that they occupy a place intermediate between the Crustacea decapoda, with which the Balani have a marked affinity, and the Crustacea entomostraca, to which the Lepades are allied; and that they have no natural affinity with the Testaceous Mollusca, as was supposed by Linnæus, and all the older systematic writers on Zoology.